What is claimed is:

1. A skew compensation apparatus comprising:

a transmitter for transmitting a parallel signal to a transmission line unit after converting the parallel signal into a plurality of serial signals; and

a receiver for performing skew compensation for the serial signals received from the transmission line unit,

said transmitter comprising means for demultiplexing an inputted parallel signal into a plurality of parallel signal groups, means for generating a skew compensation pattern, means for inserting said skew compensation pattern in each of the parallel signal groups outputted from said demultiplexing, means for converting the plurality of parallel signal groups each containing the skew compensation pattern into a plurality of serial signals, and a first interface for transmitting the serial signals to the transmission line unit,

said receiver comprising a second interface for receiving the serial signals from the transmission line unit, means for demultiplexing the serial signals received by the second interface into parallel signal groups each containing said skew

compensation pattern, a plurality of delay buffers for delaying the individual parallel signal groups outputted from the demultiplexing, and a delay controller for extracting the skew compensation pattern from each of said parallel signal groups outputted from the demultiplexing,

wherein said delay controller controls a delay time in each of said delay buffers depending on a state of the extracted skew pattern.

2. A skew compensation apparatus according to claim 1, wherein said means for generating a skew compensation pattern generates said skew compensation pattern by using a character stream in which an idle character can be inserted.

3. A skew compensation apparatus according to claim 1, wherein said delay controller has a counter for generating an internal timing to constantly monitor a skew shift in each of the signals received from the transmission line by comparing said internal timing with a phase of said skew compensation pattern.

4. A skew compensation apparatus according to

claim 1, wherein said delay controller changes each of said delay times depending on a phase of the skew pattern.

5. A skew compensation apparatus according to claim 1, wherein said delay controller is comprised of:

a plurality of decoders each for separating said skew compensation pattern from each of said parallel signal groups containing the skew compensation pattern;

a counter for generating an internal timing;

a skew amount calculator for calculating an intrinsic amount of skew occurred in each of said parallel signal groups from a difference between a phase shown by said skew compensation pattern and said internal timing; and

storing means for storing the amount of skew; and

said delay controller changes the delay time in each of the delay buffers such that the amount of skew becomes zero.

6. A skew compensation apparatus according to claim 5, wherein said delay controller constantly

monitors a state of skew in each of the parallel signal groups by comparing the internal timing generated by said counter with the phase shown by the skew compensation pattern.

7. A skew compensation apparatus according to claim 6, wherein said skew amount calculator calculates a differential value between said internal timing and said skew compensation pattern, compares said differential value with a differential value stored in said storing means, judges that the skew has shifted if the differential values are different, and overwrites the newly calculated differential value in said storing means.

8. A skew compensation apparatus according to claim 2, wherein, in said character stream, a parameter P defined by $P = T \times S \times L/C$ satisfies $m \geqq 2P + 1$, where P is rounded up to an integral number if a fraction occurs, m is a natural number indicating the number of different patterns "I_0, I_1, ..., and I_{m-1}" each composed by using x idle characters "i_0, i_1, ..., i_{n-1} (where n is a natural number and $m \leqq n^x$)" each indicative of an invalid signal allowed to flow when significant data is not transmitted,

S (s/m) is an amount of skew assumed among individual serial transmission paths, L(m) is a transmission distance of each of the serial transmission lines, T (bit/s) is a transmission rate in the serial transmission line, and C(bit) is a bit length of said pattern.

9. A skew compensation apparatus according to claim 1, further comprising a multiplexer connected between said first interface and said transmission line unit.

10. A skew compensation apparatus according to claim 1, further comprising a demultiplexer connected between said second interface and said transmission line unit.

11. A skew compensation apparatus according to claim 1, further comprising:

a first connector unit connected to said first interface, said first transmission unit including terminals for connecting to said first interface, a multiplexer for multiplexing said serial signals received from the terminals into wavelength-multiplexed signals, and a third interface for

transmitting the wavelength-multiplexed signals to said transmission line unit.

12. A skew compensation apparatus according to claim 11, further comprising:

a second connector unit connected to said second interface,

said second connector unit including a fourth interface for receiving the wavelength-multiplexed signals from said transmission line unit, a demultiplexer for demultiplexing the wavelength-multiplexed signals received from the fourth interface into a plurality of serial signals on a per optical- wavelength basis, and terminals for transmitting the serial signals passed through the demultiplexer to said second interface.

13. The skew compensation apparatus according to claim 1, wherein said means for generating a skew compensation pattern includes a programmable IC.

14. A skew compensation method comprising the steps of:

demultiplexing a parallel signal to be transmitted into a plurality of parallel signal

streams;

inserting a skew compensation pattern in each of the parallel signal streams resulting from the demultiplexing;

converting each of the plurality of parallel signal streams containing the skew compensation pattern into a serial signal;

transmitting the plurality of serial signals to a transmission line unit;

receiving the plurality of serial signals from said transmission line unit;

demultiplexing each of the received serial signals into parallel signal streams each containing the skew compensation pattern;

extracting the skew pattern from each of the parallel signal streams;

delaying at least one of said parallel signal streams by a delay time determined depending on a phase of the extracted skew pattern; and

multiplexing the parallel signal streams partially delayed into an original parallel signal.

15. A skew compensation method according to claim 14, wherein a character stream in which an idle character can be inserted is used as said skew

compensation pattern.

16. A skew compensation method according to claim 14, further comprising the step of wavelength-multiplexing the plurality of serial signals each containing the skew compensation pattern, wherein the wavelength-multiplexed signals are transmitted to said transmission line unit.